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EXAMINER

ROCHE, TRENTON J

ART UNIT

PAPER NUMBER

2193

DATE MAILED: 12/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/885,448	<b>Applicant(s)</b> HINES, KENNETH J.	
	<b>Examiner</b> Trenton J. Roche	<b>Art Unit</b> 2193	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 November 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5, 18-20 and 31-38 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 18-20 and 31-38 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. This Office Action is responsive to communications filed 20 November 2006.
2. Per applicant's request, amended claims 1, 18, 31 and 36 have been entered. Claims 1-5, 18-20 and 31-38 are currently pending.
3. Claims 1-5, 18-20 and 31-38 have been examined.

### *Claim Rejections - 35 USC § 112*

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1, 18, 31 and 36 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The claims recite the limitation of "determining that the behavioral model is too specific," however, the claim does not recite any limitations which would allow one of ordinary skill in the art to conclude how this determination step occurs, and further, what the bounds of something being "too specific" would be. Looking toward the specification, the Examiner finds reference to a model being more specific than "what the designer wants" on page 94 of the specification, however, the specification does not clear up any ambiguity concerning how one of ordinary skill in the art would go about determining that a model would be too specific, or what may be considered too specific or within the bounds of what a designer may want in terms of specificity. The claims and specification are as such not enabling for

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one of ordinary skill in the art, and would not enable the instant invention to be made or used by one of ordinary skill in the art.

6. Claims 2-5, 19, 20, 32-35, 37 and 38 are rejected as being dependent on a rejected base claim.

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 1, 18, 31 and 36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term "specific" in claims 1, 18, 31 and 36 is a relative term which renders the claim indefinite. The term "specific" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Finally, it is not disclosed how the step of determining that the behavioral model affects the claim in any way. As the scope of the limitation cannot be reasonably ascertained, the Examiner will interpret the claim limitation to include any instances of relieving the behavioral model of any specificity.

9. Claims 2-5, 19, 20, 32-35, 37 and 38 are rejected as being dependent on a rejected base claim.

### ***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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11. Claims 1-5, 18-20 and 31-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 4,965,743 to Malin et al. (hereinafter "Malin"), in view of "Debugging Heterogeneous Distributed Systems Using Event-Based Models of Behavior" by Bates.

**Per claim 1:**

Malin discloses:

- generating a record of software system events, each event record within the record of system events representing an inter-component control or dataflow interaction ("The results of the simulation can either be permanently recorded in a log file or debug text..." in col. 13 lines 34-36)
- creating a behavioral template based on a predetermined behavior of the software system ("the library designer is able to create the knowledge representation information that is needed for the creation of models and the simulation of such models" in col. 15 lines 44-47)
- wherein the predetermined behavior comprises a predetermined set of state changes selected from an execution of the software system, wherein the predetermined set of state changes represent coherent units of behavior by the system software ("Discrete event modeling and simulation is characterized by state changes in a system's entities, 'events', that occur..." in col. 4 lines 14-16. Further, note Figure 15 and the corresponding sections of the disclosure. "the method Run [model] in which the discrete event simulator runs the model by executing events on the event queue until the queue is empty" in col. 25 lines 17-19. The events are predetermined state changes, as there is a predetermination concerning placing events in the queue, which further represent coherent units of behavior by the software system, as an event is indicative of some action or behavior by the system.)

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- identifying an occurrence of the predetermined behavior within the record of software system events, based on the behavioral template (“Additional analysis is obtained by comparison of log files to specify the differences in outcomes...” in col. 10 lines 52-53)
- wherein the predetermined set of state changes may be used as a behavioral model for a debugger to recognize (The state changes are represented as a behavioral model as noted above, and further, the user of the system of Malin has access to a debug facility as noted in col. 29 lines 8-9, which gives debug information for the system.)
- determining that the behavioral model is too specific (“allows the library designer...to hide one or more of the relations in the current model...” in col. 15 lines 10-12. The user would hide some of the relations because the model was too specific in detailing relations.)

substantially as claimed. Malin does not explicitly disclose when a behavioral model is too specific, replacing a found instance of a predetermined behavior with a replacement sequence of events, wherein the replacement sequence of events is an abstract even of a higher level than one or more system events that comprise the predetermined behavior. Bates discloses in an analogous behavior-based modeling and debugging system the ability recognize a stream of system events, and abstract the recognized behaviors into a high-level abstract event (“When a user-defined behavior model is successfully matched to the event stream, this derived behavior is abstracted into a representative high-level event...” on page 5, section 2.1. Since the behavior is abstracted *into* (emphasis added) a representative high-level event, the high-level event replaces the behavior.) It would have been obvious to one of ordinary skill in the art at the time the invention was made to consolidate a series of events in the system disclosed by Malin according to the abstraction techniques discloses by Bates, as this would enable a user of Malin’s system to manage complexity, help organize the search for errors, and enhance the operation of debugging tools for distributed system, as disclosed by

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Bates on page 2, section 1. Furthermore, abstraction would formalize the modeling process and help to focus a tool user's attention on significant behaviors, as further noted by Bates in the paragraph bridging pages 2 and 3 of section 1.

**Per claim 2:**

The rejection of claim 1 is incorporated, and further, Malin discloses creating the behavioral template comprises creating a visual prototype, which represents the predetermined behavior of the software system as claimed ("This module allows the model builder to construct a model graphically..." in col. 24 lines 58-59)

**Per claim 3:**

The rejection of claim 1 is incorporated, and further, Malin discloses creating a behavior expression, which represents the predetermined behavior of the software system as claimed ("Statements are associated with processes... They are written in terms of the operators, component variables inherited from the VCs, and the values of the valueclasses defined in the language" in col. 24 lines 26-30)

**Per claim 4:**

The rejection of claim 1 is incorporated, and further, Malin discloses simulating an execution of the software system, with the record of software system events generated by the simulator as claimed ("The results of the simulation can either be permanently recorded in a log file or debug text..." in col. 13 lines 34-36)

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**Per claim 5**

The rejection of claim 1 is incorporated, and further, Malin discloses instrumenting the software system to provide an event notification to a runtime operating system for each software system event, and deploying the software system to a target architecture, and capturing all notifications from the software system and storing the event notifications to create a record of software system events as claimed (Note Figure 1, item 132.1. To perform a trace of the system, and for the Log file to have been created, the system inherently had instrumentation to provide event notification so that the events could be recorded. Further, the simulation is inherently running on a target architecture.)

**Per claim 18:**

Malin discloses:

- a software system design tool (“A specialized qualitative modeling and discrete event simulation tool...” in col. 10 lines 3-4)
- a simulator for simulating an execution of the software system (Note Figure 1, item 13 and the corresponding section of the disclosure)
- a template tool for creating a behavioral template based on a predetermined behavior of the software system (“the library designer is able to create the knowledge representation information that is needed for the creation of models and the simulation of such models” in col. 15 lines 44-47)
- wherein the predetermined behavior comprises a predetermined set of state changes selected from an execution of the software system, wherein the predetermined set of state changes represent coherent units of behavior by the system software (“Discrete event modeling and simulation is characterized by state changes in a system’s entities, ‘events’, that occur...” in



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col. 4 lines 14-16. Further, note Figure 15 and the corresponding sections of the disclosure.

“the method Run [model] in which the discrete event simulator runs the model by executing events on the event queue until the queue is empty” in col. 25 lines 17-19. The events are predetermined state changes, as there is a predetermination concerning placing events in the queue, which further represent coherent units of behavior by the software system, as an event is indicative of some action or behavior by the system.)

- wherein the predetermined set of state changes may be used as a behavioral model for a debugger to recognize (The state changes are represented as a behavioral model as noted above, and further, the user of the system of Malin has access to a debug facility as noted in col. 29 lines 8-9, which gives debug information for the system.)
- wherein the behavioral model is determined to be too specific (“allows the library designer...to hide one or more of the relations in the current model...” in col. 15 lines 10-12. The user would hide some of the relations because the model was too specific in detailing relations.)
- a debugging tool for identifying an instance of the predetermined behavior of the software system from a simulated execution of the software system based on the behavioral template (“Additional analysis is obtained by comparison of log files to specify the differences in outcomes...” in col. 10 lines 52-53. Further, “the debug facility allows the user to turn debug on or off...” in col. 29 lines 8-9)

substantially as claimed. Malin does not explicitly disclose replacing a found instance of a predetermined behavior with a replacement sequence of events, wherein the replacement sequence of events is an abstract even of a higher level than one or more system events that comprise the predetermined behavior. Bates discloses in an analogous behavior-based modeling and debugging

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system the ability recognize a stream of system events, and abstract the recognized behaviors into a high-level abstract event (“When a user-defined behavior model is successfully matched to the event stream, this derived behavior is abstracted into a representative high-level event...” on page 5, section 2.1. Since the behavior is abstracted *into* (emphasis added) a representative high-level event, the high-level event replaces the behavior.) It would have been obvious to one of ordinary skill in the art at the time the invention was made to consolidate a series of events in the system disclosed by Malin according to the abstraction techniques disclosed by Bates, as this would enable a user of Malin’s system to manage complexity, help organize the search for errors, and enhance the operation of debugging tools for distributed system, as disclosed by Bates on page 2, section 1. Furthermore, abstraction would formalize the modeling process and help to focus a tool user’s attention on significant behaviors, as further noted by Bates in the paragraph bridging pages 2 and 3 of section 1.

**Per claim 19:**

The rejection of claim 18 is incorporated, and further, note the rejection regarding claim 2.

**Per claim 20:**

The rejection of claim 18 is incorporated, and further, note the rejection regarding claim 3.

**Per claims 31-35:**

The limitations recited in claims 31-35 are substantially similar to those recited in claims 1-5, respectively, and as such, are rejected for the reasons set forth in connection with claims 1-5, respectively.

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**Per claims 36-38:**

The limitations recited in claims 36-38 are substantially similar to those recited in claims 18-20, respectively, and as such, are rejected for the reasons set forth in connection with claims 18-20, respectively.

***Response to Arguments***

12. Applicant's arguments filed 20 November 2006 have been fully considered but they are not persuasive.

**Per claims 1-5, 18-20 and 31-38:**

Applicant states that Malin and Bates, taken alone or in combination, fail to teach or reasonably suggest the newly added limitation of determining that the behavioral model is too specific. In response, the Examiner notes that neither the claim nor the specification explicitly disclose the requisite scope of what can be considered "too specific," or even how one of ordinary skill in the art would go about determining that a behavioral model is "too specific." As such, the claim limitation has been read according to the broadest reasonable interpretation, that of relieving the behavioral model of any specificity determined by the user. The Examiner notes that Malin discloses the ability for a user to hide certain relations displayed in the model, and asserts that this would occur when a user has determined that the behavioral model is too specific as displayed. Accordingly, the rejection is proper and maintained.

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***Conclusion***

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Trenton J. Roche whose telephone number is (571) 272-3733. The examiner can normally be reached on Monday - Friday, 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Trenton J Roche  
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